STATE OF SOUTH CAROLINA

BEFORE THE PUBLIC SERVICE COMMISSION

DOCKET NO. 2018-321-E

In re: Application of Duke Energy Carolinas, LLC for Approval of Proposed Electric Transportation Pilot And An Accounting Order to Defer Capital and Operating Expenses	**SIERRA CLUB COMMENTS**

I. Introduction

Sierra Club appreciates the opportunity to provide comments on Duke Energy Carolinas, LLC's ("DEC" or the "Company") proposed Electric Transportation Pilot program ("ET Pilot" or the "Pilot"). These comments address: our interest and expertise in reviewing utility proposals to accelerate transportation electrification; the benefits of transportation electrification for South Carolina; the ET Pilot components and minor modifications to maximize program impact; and additional considerations for Commission action to support transportation electrification.

For several reasons, Sierra Club supports the ET Pilot. First, the Pilot's modest portfolio of proposed programs would support electrification of three market-ready electric vehicle ("EV") technologies: electric cars, electric school buses and electric transit buses. Second, the ET Pilot would address key barriers to electrification. For electric cars, DEC proposes to deploy charging stations for two core infrastructure categories—home charging and corridor fast charging; for electric buses, DEC would help overcome the barriers of upfront infrastructure and vehicle cost, which remain obstacles despite lower total costs of ownership. Finally, the Pilot's emphasis on "learning-by-doing" and the integration of new EV load for grid and customer benefit would help South Carolina realize the many benefits of transportation electrification sooner rather than later.

For these reasons, Sierra Club urges the Commission to approve DEC's ET Pilot subject to the minor modifications described in sections IV, below, and summarized here:

- For the Residential EV Charging Program, the Company should require that recipients of rebates take service on an applicable time-of-use rate for purposes of charging the vehicle, and metering for electricity usage on that rate should be tested using the metering capabilities embedded in the smart charging stations to be deployed under that program;
- For the Direct Current Fast Charging Station Program, the Company should set the rates at ET Pilot stations to provide for fuel cost savings relative to gasoline for EV drivers;
- For the EV Transit Bus and EV School Bus Charging Programs, the Commission should lead a stakeholder process to inventory the Company's existing commercial and industrial rates that may apply to charging of medium- and heavy-duty vehicles, and reform or replace those rates as necessary to support charging use cases;

In addition, in section V below, we request that the Commission take action to direct the Company to remove any tariff restrictions that would prevent non-utility hosts of EV charging stations from pricing for EV charging services on a per kilo-watt hour basis, and further ask that the Commission direct the Company to develop EV program offerings that will address EV charging issues at multi-unit dwellings and other programs that will support clean transportation for all customers in any future filing.

II. Sierra Club's interest and expertise.

Sierra Club is the nation's oldest and largest grassroots environmental organization, with more than 3.5 million members and supporters nationwide and over 6,400 members in South Carolina. Sierra Club is dedicated to the protection of public health and the environment and has long been a leading voice for clean vehicles, from working to strengthen common-sense vehicle

efficiency and pollution standards to education and outreach efforts on the benefits of electric cars, trucks and buses.

Sierra Club has significant experience with the policy and legal issues at the intersection of EVs and utility regulation. We have worked to address these issues across the country, providing comments, expert testimony, presentations and briefing to more than 20 state utility commissions. Sierra Club is also a founding member of the Transportation Electrification Accord[1], a set of guiding principles on EV and utility regulatory issues that has been joined by over 120 organizations and companies representing labor, environmental, consumer, low-income, vehicle manufacturer, EV technology company, and investor-owned and cooperative utility interests, among others.

III. Transportation electrification can benefit all DEC customers and South Carolinians.

Done right, widespread transportation electrification will benefit all utility customers and South Carolina generally. MJ Bradley and Associates estimate that a mass market for EVs consistent with meeting long-term greenhouse gas (GHG) reduction goals could provide cumulative benefits of $24 billion to South Carolina. Of those total net benefits:

- $6.7 billion would accrue to electric utility customers in the form of reduced electric bills; and
- $17.9 billion would accrue directly to South Carolina drivers in the form of reduced annual vehicle operating costs.

[1] The Transportation Electrification Accord "outlines how transportation electrification can be advanced in a manner that benefits all utility customers and users of all forms of transportation, while supporting the evolution of a cleaner grid and stimulating innovation and competition for U.S. companies." The Accord can be accessed at: www.theevaccord.com/.

The potential $6.7 billion in reduced electric bills resulting from improved utilization of the grid estimated by MJ Bradley study is directionally consistent with numerous analyses conducted by other industry experts, including The National Research Council of the National Academies[2], Pacific Northwest National Laboratory[3], and Energy and Environmental Economics (E3).[4] Like MJ Bradley, these experts have also concluded that electricity system benefits are maximized where EV charging is managed to occur at off-peak times.

While potential $6.7 billion in grid benefits is squarely within the Commission's traditional regulatory purview, the larger $17.9 billion in reduced fuel and maintenance costs will accrue to people who are also utility customers. The electric industry and its regulators have a long history of advancing energy efficiency programs and bill-assistance programs to help utility customers who spend a disproportionate share of their income on electric bills, but the average American household spends twice as much on gasoline annually as it does on electricity. Electrifying the transportation sector provides utility regulators an opportunity to offer households more comprehensive relief, cutting their transportation fuel bill at least in half (and potentially more if customers charge during off-peak hours on properly designed time-variant rates).

Likewise, the electrification of the transportation sector in South Carolina provides the Commission with an opportunity to support regional economic gains through reduced oil consumption and to leverage an increasingly clean grid to drive significant reductions in

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[2] National Research Council of the National Academy of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles* at 105, the National Academies Press, 2015.

[3] Kinter-Meyer, Schneider, Pratt, *Impacts Assessment of Plug-in Hybrid Vehicles on Electric Utilities and Regional U.S. Power Grids* (November 2007).

[4] Energy and Environmental Economics (E3), *California Transportation Electrification Assessment Phase 2: Grid Impacts (*October 2014).

transportation sector emissions. Under the high EV-adoption scenario used by MJ Bradley, South Carolina can reduce gasoline consumption by 15.4 billion gallons through 2050.[5] South Carolina produces next to no oil[6], meaning its oil imports are a large capital drain on the economy. Given that, the numerous studies[7] concluding that EV drivers' electricity fuel expenditures and associated cost savings translate into real local economic benefits—in stark contrast to the petroleum sector—ring especially true for South Carolina.

Among the more than 25 parties submitting letters of support in this proceeding, there is no disagreement: increased EV deployment supports health, security, electricity grid, economic, and environmental benefits. This consensus view is not surprising. The body of evidence concluding that EVs support these benefits is overwhelming. At the same time, it is worth noting the diversity of the parties that share agreement. Those submitting letters of support include South Carolina elected officials, multiple school districts, transit fleet operators, electric car and bus manufacturers, environmental groups, and EV software, hardware and network technology companies of all sizes.

As explained below, DEC's ET Pilot is well designed to accelerate transportation electrification to realize the benefits described above sooner rather than later. In other words, the Company has proposed investments today that could pull forward these future benefits.

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[5] MJ Bradley & Associates, *Plug-in Electric Vehicle Cost-Benefit Analysis: South Carolina* (June 2018) at page iv.

[6] U.S. Energy Information Administration, Crude Oil Production Data and South Carolina State Profile and Energy Estimates (accessed December 7, 2018).

[7] E Korejwa, *The Returns to Vehicle Electrification: An Assessment of the Economic and Budgetary Impacts of Electric Vehicle Adoption in Oregon* (2015); J Todd et al, *Creating the Clean Energy Economy: Analysis of Electric Vehicle Industry* (2013); California Electric Transportation Coalition, *Plug in Electric Vehicle Development in California: An Economic Jobs Assessment* (2012); J Cortright, *New York City's Green Dividend* (2010).

IV. The Electric Transportation Pilot should be approved with minor modifications.

DEC's three-year, $7.1M ET Pilot program consists of four program elements: the Residential EV Charging Program, the Direct Current Fast Charging Station Program, the EV Transit Bus Charging Program, and the EV School Bus Charging Program.[8] Below, we review and offer recommendations for improvement to each. We also address the Company's plan for data collection and reporting.

a. Residential EV Charging Program

DEC's Residential EV Charging Program would fund rebate and participation payments for the deployment of up to 400 smart charging stations at customer residences.[9] The purpose of this program component is to test the customer response to, and value of, managed EV charging.[10]

The Residential EV Charging Program component targets a core infrastructure need for EV drivers. In order to enable EV adoption, it is critical for would-be drivers to have access to infrastructure in "long-dwell time" locations where cars are most frequently located and available for charging. The typical car is parked at home 50 percent of the time.[11] Unsurprisingly, the National Research Council of the National Academies of Sciences characterizes home charging as a "virtual necessity" for all EV drivers, and that residences without access to electric vehicle

[8] Application of Duke Energy Carolinas, LLC for Approval of Proposed Electric Transportation Pilot And An Accounting Order to Defer Capital and Operating Expenses [hereinafter "DEC Application"] at 3.

[9] DEC Application at 9.

[10] *Id.*

[11] *See* Adam Langton and Noel Crisostomo, *Vehicle-Grid Integration*, California Public Utilities Department at 5 (October 2013); *see also* Marcus Alexander, *Transportation Statistics Analysis for Electric Transportation*, Electric Power Research Institute (December 2011).

charging "clearly [have] challenges to overcome to make PEV ownership practical."[12] Drivers are very unlikely to purchase an EV if they cannot charge at home.[13] The rebates that DEC proposes to offer would help address this need.

The home is also the location where the vast majority of charging occurs.[14] In other words, the flexible, manageable load that EVs represent is most frequently available to provide grid services at the home. If home charging is managed to occur during off-peak periods, EV load can "fill valleys" in load without increasing overall capacity requirements. Similarly, EV load can be shifted to facilitate the integration of variable generation from renewable sources.[15] By increasing usage of standing assets, smoothing and shifting loads, and improving reliability, EV charging can lower the marginal cost of electricity for all customers. The ET Pilot would test one method for vehicle-grid integration: direct load control by leveraging the "smarts" in EVs and EV charging stations.[16]

Sierra Club supports development of managed charging for vehicle-grid integration. At the same time, we recommend that the ET Pilot also require that rebate recipients take service on an applicable time-of-use rate. Time-of-use rates are a very effective[17] form of foundational load

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[12] National Research Council of the National Academies of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles*, the National Academies Press at 9 (2015).

[13] *See* Adam Langton and Noel Crisotomo, *Vehicle-Grid Integration*, California Public Utilities Commission at 5 (October 2013).

[14] U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, *National Plug-In Electric Vehicle Infrastructure Analysis* (September 2017) (identifying a range of home charging percentages for its scenario analysis and finding 82% to 88% as consistent with early market findings by The EV Project as reported by Idaho National Laboratory).

[15] *Id.*

[16] DEC Application at 9-10; Attachment B.

[17] See, for example, The Department of Energy's EV Project, which has tracked the charging behavior of thousands of EVs since 2011, has shown that in areas with time-of-use ("TOU") rates and effective utility education and

management. With the smart charging stations that would be deployed under the Residential component, DEC has an opportunity to test the metrology that is embedded in those charging stations so as to avoid requiring a participating customer to put all of their electricity use on a time-of-use rate, or to install a second meter, which can be cost prohibitive. Sierra Club recommends that DEC incorporate this additional element for its ET Pilot in order to more fully evaluate the options for vehicle-grid integration.

b. Direct Current Fast Charging Station Program

For its Direct Current Fast Charging ("DCFC") Station Program, DEC proposes to own and operate up to 20 DCFC stations in order to establish a foundational level of charging infrastructure along highway corridors in the state.[18] Like home charging, access to DCFC stations for distance travel strongly influences EV adoption decisions and is an important part of a comprehensive charging network. Without access to DC fast charging, vehicle range can be a limiting factor, and inter-city or distance travel is often impossible or impractical for all-electric vehicle drivers.[19] In addition to inhibiting distance travel and exacerbating anxieties about vehicle range, consumer research indicates that a "lack of robust DC fast charging infrastructure is seriously inhibiting the value, utility, and sales potential" of typical pure-battery electric vehicles.[20]

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outreach, the majority of EV charging occurs during off-peak hours. This was not the case in areas without TOU rates, where EV demand generally peaked in the early evening, exacerbating early-evening system-wide peak demand. *See* Schey, et al., *A First Look at the Impact of Electric Vehicle Charging on the Electric Grid, The EV Project at EVS26* (May 2012).

[18] DEC Application at 12-14.

[19] Nick Nigro *et al.*, *Strategic Planning to Implement Publicly Available EV Charging Stations: A Guide for Businesses and Policymakers* (2015) at 11.

[20] PlugShare, New Survey Data: BEV Drivers and the Desire for DC Fast Charging (March 2014).

As with many network industries, the development of DC fast charging networks suffers from a "chicken-or-the-egg" market coordination problem. Prospective EV owners are reluctant to purchase an electric car in the face of limited access to charging infrastructure, while prospective hosts and backers of EV charging infrastructure cannot see a business case for EV charging station investment where too few EVs are in use. The market coordination problem is acute for DC fast charging stations, which have "high upfront costs" and "require significant revenues for the owner-operator to achieve profitability."[21] However, quantitative research on this "chicken-or-the-egg" problem in the EV context not only indicates that the increased supply of more EVs would drive the deployment of more public charging and vice-versa, but that a financial subsidy given to infrastructure investment will increase EV sales by more than twice the amount of the increase if the financial incentive is provided for EV purchase.[22] DEC's proposed DCFC Station Program would help overcome the market coordination issues, and drive vehicle adoption.[23]

When drivers pull up and plug-in to ET Pilot DCFC stations, DEC proposes that they will pay a market rate.[24] We recommend that the market rates set by DEC do not exceed the equivalent price of gasoline. Fuel cost savings are a key driver of EV adoption. A survey of nearly 20,000 EV reveals that fuel cost savings are the single biggest motivator of EV purchase decisions.[25] If the

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[21] Nick Nigro *et al.*, *Strategic Planning to Implement Publicly Available EV Charging Stations: A Guide for Businesses and Policymakers* (2015) at 11.

[22] Li S *et al.*, *The Market for Electric Vehicles: Indirect Networks Effects and Policy Design*, Journal of the Association of Environmental and Resource Economists 4, no. 1 (March 2017).

[23] *Id.* (finding that "the increased availability of public charging stations has a statistically and economically significant impact on EV adoption decisions.").

[24] DEC Application at 13-14.

[25] California Clean Vehicle Rebate Project, EV Consumer Survey Dashboard (available at https://cleanvehiclerebate.org/eng/survey-dashboard/ev, visited Sept 6, 2018).

DCFC stations deployed under the ET Pilot fail to provide the fuel savings that motivate EV purchase decision, then the program's ability to accelerate the EV market and to deliver the resulting benefits upon which the proposed investment of utility-customer funds is partially justified will be compromised.

c. The EV Transit Bus Charging Program

For the Transit Bus Charging Program component, DEC proposes to support the adoption of up to 20 transit buses through rebates that will support vehicle purchase and installation of associated infrastructure.[26] Sierra Club strongly supports this program element. Among the many demonstrated, market-ready technologies in the medium- and heavy-duty sectors, there is no question that electric buses are ready for prime time. In 2015, the California Air Resources Board concluded that "zero emission transit buses are primed to be one of the first heavy-duty vehicle types to achieve significant zero-emission vehicle sales volumes, leading and supporting technology development in the heavy-duty sector as a whole."[27] Most bus manufacturers offer zero emission buses[28] —including South Carolina-located manufacturers—and multiple fleets already operate zero emission buses in regular revenue service.[29]

To be sure, there is a cost premium to purchase an electric bus over a conventional diesel bus, but the total cost of ownership for an electric transit bus can be lower than for a diesel or CNG bus even with that cost premium, due to maintenance and fuel cost savings. Put another way, DEC's proposed Transit Bus Charging Program could help meet the higher up-front capital requirements of an electric bus and charging infrastructure, allowing a transit agency to then lock

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[26] DEC Application at 12.

[27] California Air Resources Board, *Advanced Clean Transit Regulation: Discussion Document* (May 2015).

[28] California Air Resources Board, *Innovative Clean Transit Regulation: Discussion Document* (December 2017).

[29] *Id.*

in the lower lifetime costs of electric buses. Lifetime savings can be re-invested into additional purchases of electric buses, creating a positive economic cycle, where a transit agency can continue to electrify its bus fleet, and further drive down operational costs as electric buses replace the entire fleet.

In its Application, DEC states that it "believes there are significant potential operational cost savings" for electric buses used in its service territory.[30] Operational costs typically fall into two categories: maintenance and fuel. Maintenance cost savings are substantially less than conventional vehicles.[31] The fuel cost savings from electricity fuel versus diesel are also substantial in theory, but can be frustrated by utility demand charges that do not accurately reflect the costs associated with transportation electrification use cases[32] and frustrate or erase the fuel cost savings upon which the economics of transportation electrification depend.[33]

To ensure that the ET Pilot is successful and that it supports transportation electrification broadly, we recommend that the Commission lead a process to inventory and take stakeholder input on DEC's commercial and industrial rates that may be applicable to the charging of transit or other medium- and heavy-duty vehicles, and to reform or replace those rates where necessary. In making this recommendation, we are not recommending that transportation electrification loads be subsidized, but that rate design should be optimized to account for the intended use cases.

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[30] DEC Application at 12.

[31] *See, e.g.*, U.S. Federal Transit Administration, *King County Metro Battery Electric Bus Demonstration--Preliminary Project Results* (M.., 2017) (finding that the monthly per-mile maintenance costs of electric buses averaged $0.18/mi while diesel and hybrid buses averaged $0.32/mi and $0.44/mi, respectively).

[32] Examples of "use cases" might include (1) at-home charging of passenger EVs; (2) public charging at Level 2 or Direct Current Fast Charging stations; (3) charging of medium- and heavy-duty fleets that are publicly or privately owned, among others.

[33] *See, e.g.*, ICF, California Transportation Electrification Assessment – Phase 3-Part A: Commerical and Non-Road Grid Impacts – Final Report," at 47 (Jan. 2016) (finding that "[u]tility rate structures are one of several key decision factors for potential [transportation electrification] consumers, and can represent the difference between a consumer accruing a return on their investment or realizing a net loss.").

Because demand charges often do a poor job of reflecting actual distribution system costs, and because energy costs are better reflected in time-varying volumetric rates, reforming demand charges in general is good policy.[34]

As an example, the Commission and DEC should look to recent efforts to optimize rates for transportation electrification use-cases, including the suite of recently approved Southern California Edison (SCE) rates that were refined in a stipulation between SCE, NRDC, Sierra Club, the Environmental Defense Fund, Siemens, the Coalition of California Utility Employees, and the Office of Ratepayer Advocates (which is housed in the California Public Utilities Commission).[35] Those rates are not subsidized, but have no demand charge component for the next five years, at which point demand charges will be phased in as utilization increases. Likewise, the Commission should examine a suite of rates that Pacific Gas & Electric recently proposed that incorporate a time-based energy charge and subscription fee, and do not include demand charges.[36]

d. The EV School Bus Charging Program

With the School Bus Charging Program, DEC would facilitate the replacement of old diesel school bus with clean electric models through rebates for the purchase of up to 20 buses and associated charging infrastructure.[37] Like electric transit buses, electric school buses are also market-ready and share in the same lifetime operation cost savings as transit buses.

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[34] *See Borenstein, Severin, The Economics of Fixed Cost Recovery by Utilities*, Energy Institute at Haas Working Paper 272R (July 2016).

[35] *See* Decision on the Transportation Electrification Standard Review Projects (D.18-05-040) at 110-17, A.17-01-020 *et al.*, California Public Utilities Commission (issued June 6, 2018).

[36] Application for Approval of Pacific Gas and Electric Company's (U 39 E) Commercial Electric Vehicle Rate, Application No. A.18-11-003, California Public Utilities Commission (filed November 5, 2018).

[37] DEC Application at 10-11.

Moreover, electrifying school buses can help a particularly vulnerable population—children. Regrettably, children are often the most exposed and most vulnerable to diesel emissions from school buses. Over 25 million children ride school buses each day nationwide, more than transit and passenger rail combined. [38] Children are exposed to diesel fumes while riding and getting on and off diesel school buses. Asthma, which diesel pollution exacerbates, is now the most common chronic condition among U.S. children, affecting 1 in 10 in the United States.[39] A University of Michigan and University of Washington public health study found that cleaner school transportation for children provides significant health benefits and could prevent 14 million school absences each year.[40] The School Bus Charging Program would help to overcome the upfront cost premium that stands between South Carolina school children and clean transportation to and from their classrooms.

In addition to significant health benefits, school buses are well-suited to facilitate the integration of renewables and support the electric grid due to their predictable duty-cycles. Sierra Club therefore strongly supports the vehicle-to-grid ("V2G") aspect of the School Bus Charging Program, and requests an opportunity to provide input as the details of the V2G testing materialize.

To ensure that, like the Transit Bus Charging Program, the School Bus Charging Program is not a one-off pilot and instead supports broader electric school bus adoption South Carolina, Sierra Club strongly recommends that the Commission lead a stakeholder process to take stakeholder input on its applicable rates for medium- and heavy-duty charging, and to reform or replace rates where necessary.

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[38] National School Transportation Association, *The Yellow School Bus Industry* (2013).

[39] Respiratory Health Association, *Asthma in Chicago Disparities: Perspectives and Interventions* (2011) at 1.

[40] SD Adar *et al.*, *Adopting Clean Fuels and Technologies on School Buses. Pollution and Health Impacts in Children* (June 2015).

e. Data collection and reporting

As part of the ET Pilot, DEC proposes to collect data and report it annually.[41] To promote transparency and learning-by-doing in this pilot project, the Company should commit to more regular reporting and clarify its data collection plan.

In its application, DEC commits to file an "final report" with data on "overall cost figures, load profiles of residential, DCFC and public transit charging; cost savings of public transit agencies; information about charging station costs; insights learned by the Company regarding the effect of the program on the electric vehicle supply equipment ("EVSE"); and EV market development in South Carolina."[42] Sierra Club recommends that DEC make several important additions: first, to report the prices charged to EV drivers at DCFC stations; second, to report on managed charging response events and customer participation for the Residential Charging Program; and, third, to collect the same information about the School Bus Charging Program as the Company plans to collect for the Transit Bus Charging program. In addition, the

The Company also notes that it will file "annual reports"[43] with the Commission, but does not specify what information they will include. We recommend that the annual filings report the same data that the Company intends to the include in the final report. In addition, like the final report, the annual reports should also be available to the public.

V. Additional Considerations

In addition to the ET Pilot recommendations discussed above, we offer two recommendations for additional Commission and DEC action to support growth in the EV market.

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[41] DEC Application at 15.

[42] *Id.*

[43] *Id.* at 5.

a. The Commission should order DEC to remove any tariff restrictions on the pricing of electric vehicle charging services by non-utility providers.

To better enable the EV charging market, the Commission should direct DEC to remove any tariff restrictions that would prohibit non-utility owners or operators of EV charging ("site hosts") in South Carolina from pricing EV charging services on a kilo-watt hour basis that reflects actual energy consumption.

This promotes several basic policy objectives. First, volumetric, per kilowatt-hour pricing supports price transparency for EV drivers. The kilowatt-hour is the common and familiar metric for measuring electricity consumption. Second, because kilowatt-hour pricing reflects actual energy consumed by an EV and not, for example, the time spent plugged in, it supports pricing that more accurately reflects EV driver's fuel costs. Take, for example, two electric cars that support common but different rates of charge: Car 1 has a charging capability of 3.3 kW, while Car 2 is rated for 6.6 kW. Assuming all else is equal, Car 1 will take twice as long to charge up as Car 2. Under a time-based pricing scheme (e.g., per minute)—the sort of scheme that is forced where per kilo-watt hour pricing is prohibited—driver of Car 1 will pay twice as much as the driver of Car 2 even though they have consumed an equal amount of electricity.

Finally, per kilowatt-hour pricing allow site hosts to set prices for EV charging that reflect underlying grid conditions and encourage EV drivers to plug in at the right times, like TOU rates. In turn, this better enables site hosts to recover their own electricity costs. If site hosts are unable to pass time-varying price signals on to EV drivers—the people that need to "see" price signals if they are to respond to them—then grid integration of charging load and the benefits it can provide for all utility customers will be undermined.

b. In future filings, DEC should address electric vehicle charging needs in the critical but underserved multi-unit dwelling market and take additional action to improve access to clean transportation options for all customers.

In the ET Pilot Application, DEC states that "if the Pilot is successful, the Company may seek to grow the Pilot or seek early termination of the Pilot in favor of a full scale offering to be filed with the Commission for approval."[44] We recommend that any future filing, whether a full scale filing or a separate pilot, but in any event no later than the conclusion of the ET Pilot, DEC should propose a targeted EV program that includes solutions for charging at multi-unit dwellings and solutions directed at improving access to clean transportation options for low-to-moderate income communities.

As explained in section IV, drivers are unlikely to purchase plug-in vehicles if they cannot plug-in at home, where cars are typically parked for at least half the day.[45] However, less than half of U.S. vehicles have reliable access to dedicated off-street parking at an owned residence where charging infrastructure could be installed.[46] To-date, almost 90 percent of EV drivers live in single-family detached homes.[47] As the National Academy of Sciences notes: "Lack of access to charging infrastructure at home will constitute a significant barrier to EV deployment for households without a dedicated parking spot or for whom the parking location is far from access to electricity."[48] Even if an EV driver can persuade an apartment owner or manager to engage in considerable learning and agree to install a charging station, considerable challenges remain:

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[44] DEC Application at 4.

[45] *See* Adam Langton and Noel Crisostomo, *Vehicle-Grid Integration*, California Public Utilities Department at 5 (October 2013); *see also* Marcus Alexander, *Transportation Statistics Analysis for Electric Transportation,* Electric Power Research Institute (December 2011).

[46] Traut *et al.*, *US Residential Charging Potential for EVs (Transportation Research Part D)* (November 2013).

[47] Center for Sustainable Energy, *California Plug-in EV Owner Survey Dashboard, available at* https://cleanvehiclerebate.org/eng/survey-dashboard/ev

[48] National Research Council of the National Academy of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles* at 105, the National Academies Press, 2015.

parking lots are often common or shared spaces, complicating authorization to install charging stations and billing arrangements; the costs of installing infrastructure at a distance from the building is more expensive; and, in the case of renters, investments in charging infrastructure may not be recoverable within their expected tenancy. Utilities are uniquely positioned to address the these challenges, and DEC should do so in any future filing.

In addition, DEC should develop dedicated programs to increase access to the use of electricity as a transportation fuel in low and moderate-income communities and to address sources of transportation pollution that disproportionately impact frontline communities. Examples of program elements that DEC could implement or support include the following:

- Dedicating that a specific percentage of incentives delivered or infrastructure installed for light-duty vehicle charging occur in specific communities, and that incentive levels are higher in those communities[49];
- Designate that transit or school bus electrification efforts will primarily serve and/or travel through certain low-to-moderate income communities[50];
- Ride-share programs like BlueLA and BlueIndy—programs in Los Angeles and Indianapolis, respectively—that offer 24/7 access to a network of affordable shared electric vehicles placed strategically in low-income neighborhoods;

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[49] *See, e.g.,* Decision 16-12-065, Docket A.15-02-009, California Public Utilities Commission (filed December 21, 2017) (approving a $130M electric vehicle infrastructure investment for Pacific Gas & Electric, including: (1) a requirement that 15% of stations be located in disadvantaged communities as defined by California law and including a stretch goal of 20% deployment in disadvantaged communities; and (2) providing 100% rebates for stations located in disadvantaged communities, as opposed to partial rebates for stations deployed outside of that segment); Case 17-05, Department of Public Utilities (filed November 30, 2017) (approving a $45M electric vehicle infrastructure investment for Eversource, including a 10% requirement for deployment of stations in disadvantaged communities).

[50] *See, e.g.*, Decision 16-12-065, Docket A.17-01-020, California Public Utilities Commission (filed May 31, 2018) ($300M of the approved investment will go toward electrification of vehicles in or adjacent to disadvantaged communities).

- Supporting infrastructure and vehicle cost-share for the electrification of trucks, buses, ground support equipment and port equipment that cause disproportionate impact to certain communities through local diesel pollution[51];

VI. Conclusion

For the reasons discussed above, Sierra Club respectfully requests that the Commission approve the ET Pilot program with the modifications described herein.

Respectfully submitted this 10th day of December, 2018.

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[51] *Id.* (approving $600M worth of programs for the states' investor-owned utilities that target electrification of medium- and heavy-duty vehicles, including on- and off-road vehicles).

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I hereby certify that on this date, I served the following persons with the foregoing Petition to Intervene by electronic mail and/or U.S. First Class Mail, addressed as follows:

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